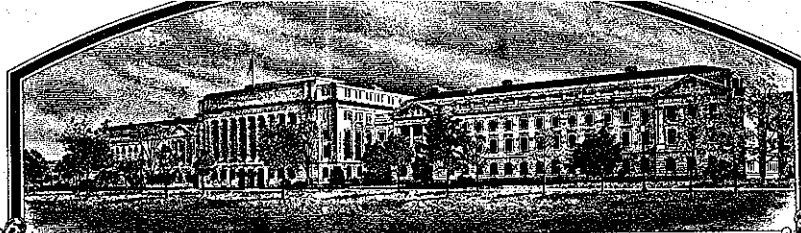


No.

7900041



# THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

**Northrup King Company**

Whereas, THERE HAS BEEN PRESENTED TO THE

**Secretary of Agriculture**

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *eighteen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS OF THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

RED CLOVER

'Tristan'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington this 26th day of March in the year of our Lord one thousand nine hundred and eighty-one.

Attest.

*Lyman H. Kiser*  
Commissioner  
Plant Variety Protection Office  
Grain Division  
Agricultural Marketing Service

*John R. Block*  
Secretary of Agriculture

UNITED STATES DEPARTMENT OF AGRICULTURE  
AGRICULTURAL MARKETING SERVICE  
LIVESTOCK, POULTRY, GRAIN & SEED DIVISION

FORM APPROVED  
OMB NO. 40-R3822

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

No certificate for plant variety protection may be issued unless a completed application form has been received (5 U.S.C. 553).

INSTRUCTIONS: See Reverse.

1a. TEMPORARY DESIGNATION OF VARIETY K8-114		1b. VARIETY NAME Tristan		FOR OFFICIAL USE ONLY PV NUMBER 7900041	
2. KIND NAME Red Clover		3. GENUS AND SPECIES NAME Trifolium pratense		FILING DATE 1-25-79	TIME 4:00 P.M.
4. FAMILY NAME (BOTANICAL) Leguminosae		5. DATE OF DETERMINATION November, 1978		FEE RECEIVED \$ 500.00 \$ 250.00	DATE 1-25-79 2/3/81
6. NAME OF APPLICANT(S) Northrup King Co.		7. ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code) P. O. Box 959 Minneapolis, MN 55440		8. TELEPHONE AREA CODE AND NUMBER (612) 781-8011	
9. IF THE NAMED APPLICANT IS NOT A PERSON, FORM OF ORGANIZATION: (Corporation, partnership, association, etc.) Corporation			10. IF INCORPORATED, GIVE STATE AND DATE OF INCORPORATION Delaware		11. DATE OF INCORPORATION 1896
12. NAME AND MAILING ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS: <del>Allenby L. White</del> Dr. Robert W. Romig Northrup King Co. P. O. Box 959 Minneapolis, MN 55440					
13. CHECK BOX BELOW FOR EACH ATTACHMENT SUBMITTED:					
<input checked="" type="checkbox"/> 13A. Exhibit A, Origin and Breeding History of the Variety (See Section 52 of the Plant Variety Protection Act.)					
<input checked="" type="checkbox"/> 13B. Exhibit B, Novelty Statement.					
<input checked="" type="checkbox"/> 13C. Exhibit C, Objective Description of the Variety (Request form from Plant Variety Protection Office.)					
<input checked="" type="checkbox"/> 13D. Exhibit D, Additional Description of the Variety.					
14a. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? (See Section 83(a). (If "Yes," answer 14B and 14C below.) <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO					
14b. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			14c. IF "YES," TO 14B, HOW MANY GENERATIONS OF PRODUCTION BEYOND BREEDER SEED? <input checked="" type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input checked="" type="checkbox"/> CERTIFIED		
15a. DID THE APPLICANT(S) FILE FOR PROTECTION OF THIS VARIETY IN OTHER COUNTRIES? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO (If "Yes," give name of countries and dates.)					
15b. HAVE RIGHTS BEEN GRANTED THIS VARIETY IN OTHER COUNTRIES? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO (If "Yes," give name of countries and dates.)					

16. DOES THE APPLICANT(S) AGREE TO THE PUBLICATION OF HIS/HER (THEIR) NAME(S) AND ADDRESS IN THE OFFICIAL JOURNAL? ☒ YES ☐ NO

17. The applicant(s) declare(s) that a viable sample of basic seed of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

January 17, 1979  
(DATE)

Allenby L. White  
(SIGNATURE OF APPLICANT)

(DATE)

(SIGNATURE OF APPLICANT)

## INSTRUCTIONS

**GENERAL:** Send an original copy of the application and exhibits, at least 2,500 viable seeds, and \$500 fee (\$250 filing fee and \$250 examination fee) to U.S. Dept. of Agriculture, Agricultural Marketing Service, Livestock, Poultry, Grain and Seed Division, Plant Variety Protection Office, National Agricultural Library Building, Beltsville, Maryland 20705. (See section 180.175 of the Regulations and Rules of Practice.) Retain one copy for your files. All items on the face of the form are self-explanatory unless noted below.

### ITEM

- 5 Give the date the applicant determined that he had a new variety based on (1) the definition in section 41(a) of the Act and (2) the date a decision was made to increase the seed.
- 13a Give: (1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method; (2) the details of subsequent stages of selection and multiplication; (3) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified and (4) evidence of uniformity and stability.
- 13b Give a summary statement of the variety's novelty. Clearly state how this novel variety may be distinguished from all other varieties in the same crop. If the new variety most closely resembles one or a group of related varieties: (1) identify these varieties and state all differences objectively; (2) attach statistical data for characters expressed numerically and demonstrate that these differences are significant; and (3) submit, if helpful, seed and plant specimens or photographs of seed and plant comparisons clearly indicating novelty.
- 13c Fill in the Exhibit C, Objective Description form, for all characteristics for which you have adequate data.
- 13d Describe any additional characteristics that are not described, or whose description cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the description of characteristics that are difficult to describe, such as, plant habit, plant color, disease resistance, etc.
- 14a If "YES" is specified (seed of this variety be sold by variety name only as a class of certified seed) the applicant may NOT reverse his affirmative decision after the variety has either been sold and so labeled, his decision published, or the certificate has been issued. However, if the applicant specified "NO," he may change his choice. (See section 180.16 of the Regulations and Rules of Practice.)
- 15a See section 42 of the Plant Variety Protection Act and section 180.7 of the Regulations and Rules of Practice.

EXHIBIT A

Origin and Breeding History of Tristan Medium Red Clover

1. Tristan is a synthetic variety originating from a cross made between several hundred plants of Dollard X Illinois No. 2<sup>(1)</sup> in 1964. Seed was produced on phenotypically healthy plants from the Illinois No. 2 parent.
2. Two cycles of selection followed, concentrating on resistance to northern anthracnose, powdery mildew, and unspecified virus diseases. Over 100 plants were retained following each cycle. Seed produced on the next generation following selection has been retained as pre-breeder's seed.
3. No plants unrepresentative of the variety have been observed in the various multiplications of it.
4. We have detected no shift of any agronomic or morphological characteristic in either space-planted nurseries or in replicated yield trials which shows that the variety is stable. Multiplication of Tristan will be limited to two generations beyond breeder's seed.

(1) Subsequently named "Redland" and now a protected variety.

EXHIBIT B

Tristan is a diploid medium red clover which is most similar to Kenstar, but differs from that variety in that it is more fall dormant, has shorter regrowth after cutting, and is resistant to northern anthracnose (Kabatella caulivora).

OBJECTIVE DESCRIPTION OF VARIETY  
RED CLOVER (*Trifolium Pratense*)

NAME OF APPLICANT(S) Northrup King Co.	VARIETY NAME OR TEMPORARY DESIGNATION Tristan
ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code) P. O. Box 959 Minneapolis, MN 55440	FOR OFFICIAL USE ONLY PVPO NUMBER 7900041

Place the appropriate number that describes the varietal character of this variety in the boxes below. Fill unused columns with zeros (e.g.  when number is 99). In comparisons to standard varieties, the value  should only be used to indicate that the varieties are equal. The symbol ▲ indicates a decimal point. Characteristics described, including numerical measurements, should represent those which are TYPICAL for the variety. Measured data should be for SPACED PLANTS. Any recognized color fan, e.g. Royal Horticultural Colour Chart, may be used to determine plant colors; designate system used: Munsell. Give location of test area Stanton, MN. Ranges of values are valuable and may be included with additional description elsewhere in the application.

NOTE: For single plant data a minimum of 100 plants is suggested.

## 1. TYPE:

1 = DOUBLE CUT (medium)      2 = SINGLE CUT (mammoth)      3 = OTHER (Specify) \_\_\_\_\_

## 2. PLOIDY:

1 = DIPLOID      2 = TETRAPLOID      3 = OTHER (Specify) \_\_\_\_\_

## 3. PRODUCTIVE PERSISTENCE (Usual duration of planting):

1 = ANNUAL      2 = BIENNIAL      3 = SHORT LIVED PERENNIAL (3 - 4 Years)

4. ADAPTATION: (e.g.,  = northcentral and southcentral)

1 = NORTHEAST      2 = NORTHCENTRAL      3 = SOUTHCENTRAL  
4 = SOUTHEAST      5 = WEST      6 = OTHER (Specify) \_\_\_\_\_

## STANDARD VARIETIES

1 = KENSTAR      2 = ARLINGTON      3 = PENNSCOTT      4 = TENSAS      5 = ALTASWEDE

## 5. MATURITY:

% PLANTS FLOWERING IN SEEDLING YEAR

## Beginning of spring growth:

DAYS EARLIER THAN.....  STANDARD VARIETY

DAYS LATER THAN.....  STANDARD VARIETY

## Time of flowering (50% of plants in bloom): (from spring growth in non-seedling year)

DAYS EARLIER THAN.....  STANDARD VARIETY

DAYS LATER THAN.....  STANDARD VARIETY

## 6. PLANT HEIGHT (from soil level to top of flowering head at 50% flowering)

CM. TALL       CM. SHORTER THAN  STANDARD VARIETY

CM. TALLER THAN  STANDARD VARIETY

**7. FLOWERING STEM** (from first noncontracted internode, longer than 0.5 cm., to tip of flowering head):

0	6
---	---

 NO. FLOWERING STEMS PER CROWN

0	8
---	---

 NO. INTERNODES

5	5
---	---

 CM. LENGTH OF STEM
**Hairiness:** Give percentage of plants with each type of surface (Total = 100%)

0	6	7
---	---	---

 % HAIRS PROJECTING UPWARD

0	2	9
---	---	---

 % HAIRS PROJECTING DOWNWARD OR AT RIGHT ANGLES

0	0	4
---	---	---

 % GLABROUS (FEWER THAN 5 HAIRS/1 CM. PATH ALONG CENTRAL INTERNODES)
**Habit:** Give percentage of plants with each type of habit. Stem habit should be determined by the angle of lowest stems to the horizontal (soil level) at 50% flowering.

0	1	5
---	---	---

 % PROSTRATE (0 - 30°)

0	3	8
---	---	---

 % SEMI-PROSTRATE (30 - 45°)

0	3	7
---	---	---

 % SEMI-ERECT (45 - 60°)

0	1	0
---	---	---

 % ERECT (60 - 90°)
**8. LEAF** (Central leaflet at 3rd node below flowering head):

2	3
---	---

 MM WIDTH

0	2
---	---

 MM NARROWER THAN .....

1
---

 STANDARD VARIETY

--	--

 MM WIDER THAN .....

--

 STANDARD VARIETY

3	9
---	---

 MM LENGTH

0	4
---	---

 MM SHORTER THAN .....

1
---

 STANDARD VARIETY

--	--

 MM LONGER THAN .....

--

 STANDARD VARIETY
**Color:**

2
---

 1 = LIGHT GREEN (Altaswede)

--

 2 = MEDIUM GREEN ( )

--

 3 = DARK GREEN (Hungaropoli)

--

 4 = BLUE GREEN ( )

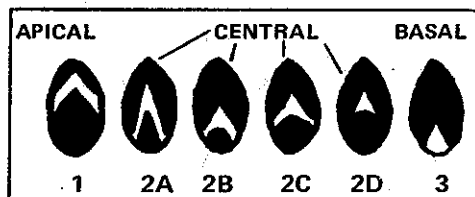
Leaf Marking (at 50% flowering): **NOTE:** Categories below allow for increasingly detailed description of the same data. Diagram illustrates terms: 1 = APICAL 2A = FULL 2B = EXTENDED 2C = DELTA 2D = INCOMPLETE 3 = BASAL

**Presence of Mark:** Of total plants, give percentage marked and unmarked (Total = 100%)

0	5	2
---	---	---

 % ABSENT

0	4	8
---	---	---

 % MARKED
**Position of Mark:** Of total plants, give percentage with leaf mark in each position (Total = % marked, above)

0	0	0
---	---	---

 % APICAL

0	4	8
---	---	---

 % CENTRAL

0	0	0
---	---	---

 % BASAL
**Shape of Mark:** Of total plants, give percentage with central leaf marks having each shape (Total = % marked, above)

0	0	5
---	---	---

 % FULL

0	0	1
---	---	---

 % EXTENDED

0	0	2
---	---	---

 % DELTA

0	4	0
---	---	---

 % INCOMPLETE
**9. FLOWER COLOR** (Determine color on freshly opened florets): Give percentage of plants with each color (Total = 100%).

Colors are referenced to the Munsell Color System.

0	0	0
---	---	---

 % WHITE

0	0	1
---	---	---

 % LIGHT PINK (5RP 8/4)

0	1	2
---	---	---

 % MEDIUM PINK (5RP 7/6)

0	8	3
---	---	---

 % DARK PINK (5RP 6/8)

0	0	4
---	---	---

 % RED (5RP 5/10)

--	--	--

 % OTHER (Specify) \_\_\_\_\_

**10. SEED COLOR:** Maximum color development in unstored, mature seed (at beginning of calyx browning). Give percentage of plants with each seed color (Total = 100%)

% YELLOW

% YELLOW WITH SOME PURPLE

% PURPLE

% PURPLE WITH SOME YELLOW

% OTHER (Specify) \_\_\_\_\_ (attach explanation)

**11. DISEASE AND INSECT RESISTANCE** (0 = not tested, 1 = susceptible, and 2 = resistant). If variety is claimed to be resistant or to show intermediate reaction, substantiating test scores should be attached clearly identifying disease, application variety, check varieties, date and location of test, and range and direction of test scores.

**A. DISEASES:**

CROWN ROT (*Sclerotinia trifoliorum*)
ROOT ROT (*Fusarium spp.*)
NORTHERN ANTHRACNOSE (*Kabatiella caulivora*)
SUMMER BLACK STEM (*Cercospora zebrina*)
SOUTHERN ANTHRACNOSE (*Colletotrichum trifolii*)
BLACK STEM (*Phoma trifolii*)
TARGET SPOT (*Stemphylium sarcinaeformae*)
POWDERY MILDEW (*Erysiphe polygoni*)
PEPPER SPOT (*Leptosphaeralina trifolii*)
BLACK PATCH (*Rhizoctonia leguminicola*)

RED CLOVER VEIN MOSIAC VIRUS

BEAN YELLOW MOSIAC VIRUS

NEMATODE (Specify) \_\_\_\_\_

OTHER (Specify) \_\_\_\_\_

**B. INSECTS:**

CLOVER ROOT BORER (*Hylastinus obsurus*)
CLOVER ROOT CURCULIO (*Sitona hispidula*)
SWEETCLOVER WEEVIL (*Sitona cylindricollis*)
CLOVER SEED CHALCID (*Bruchophagus platyptera*)
LESSER CLOVER LEAF WEEVIL  
(*Hypera nigrostris*)
POTATO LEAFHOPPER (*Empoasca fabae*)
YELLOW CLOVER APHID (*Therioaphis trifolii*)
MEADOW SPITTLERBUG (*Philaenus spumarius*)
CLOVER SEED MIDGE (*Dasineura leguminicola*)
PEA APHID (*Acyrthosiphon pisum*)
CLOVER LEAFHOPPER (*Aceratagallia sanguinolenta*)

OTHER (Specify) \_\_\_\_\_

**12. Indicate the variety most closely resembling the application variety for the following:**

CHARACTER	VARIETY	CHARACTER	VARIETY
LEAFLET SHAPE	Kenstar	SEED COLOR	Florie
CUTTING RECOVERY	Florex	LATE SEASON GROWTH	Florex
WINTER HARDINESS	Dollard	PERSISTENCE	Florie

**REFERENCES:**

- Hawkins, R. P. 1953. Investigations on local strains of herbage plants II. Types of red clover and their identification. J. Brit. Grassland Soc. 8, 213-218.  
 Williams, R. D. 1927. Red clover investigations, 1919 - 1926. Welsh Plant Breeding Station Bull., Ser. H, No. 7.

**COMMENTS:** (If additional space is necessary, use reverse side)



Data Indicative of NoveltyA. Leaf Size

<u>Variety</u>	<u>Length mm</u>	<u>Width mm</u>
Tristan	39.0	23.3
Arlington	45.6	25.2
Kenstar	43.0	24.7

LSD .05 = 2.2

LSD .05 = 1.6

C.V. = 4.7

C.V. = 5.9

B. Leaf Marking

<u>Variety</u>	<u>% Marked Leaves</u>
Tristan	48
Arlington	64
Kenstar	75

LSD .05 = 9.5

C.V. = 8.9

C. Flower Color

<u>Variety</u>	<u>% Light Pink</u>	<u>% Medium Pink</u>	<u>% Dark Pink</u>	<u>% Red</u>
Tristan	1.0	12.1	83.2	3.5
Arlington	2.8	19.9	75.3	2.1
Kenstar	1.2	18.1	78.5	2.4
LSD .05 =	1.4	4.1	4.2	.5
C.V. =	15.2	10.7	2.3	8.3

D. Fall Dormancy Measured in Solid Sward

<u>Variety</u>	<u>CM Height October 13</u>
Tristan	24.5
Arlington	28.5
Kenstar	31.0
Florex	24.0
Lakeland	27.3
Prosper I	28.3
LSD .05 =	2.2
C.V. =	5.5

EXHIBIT D cont'd.E. Regrowth After Cutting Measured in Solid Sward

<u>Variety</u>	<u>CM Height (3 weeks after cutting)</u>
Tristan	23.3
Arlington	27.0
Kenstar	30.0
Florex	22.3
Lakeland	27.3
Prosper I	26.7
Florie	26.3
LSD .05 =	3.5
C.V. =	7.7

# SUMMARY OF DISEASE RESISTANCE

	NORTHERN ANTHRACNOSE I				MILDEW II			BLACK PATCH III	
	Stanton, MN			Wisconsin	Stanton, MN	Kentucky	Wisconsin	Kentucky	
	1971	1973	1974	1975					1974
									1972
Florie	1.0(1)	82(3)	1.6(1)	1(2)	78(3)	72(3)	1.8 A C(1)	4.0 C D (1)	
Tristan	3.0	70	2.3	1	79	--	1.5 A B	3.2 A C	
Florex	1.7	87	1.0	1	58	23	3.0 B D	7.5 E E	
Prosper I	1.7	91	1.0	1	92	--	2.3 A C	5.5 D D	
Dollard	1.0	--	2.6	1	--	--	--	--	
Lakeland	2.3	--	1.5	1	--	72	3.5 B E	3.0 A C	
Kenland	9.0	--	7.3	-	--	14	6.6 F F	3.2 A C	
Kenstar	---	--	7.0	5	--	--	5.8 E F	1.5 A A	

I - Kabatiella caulivora

II - Erysiphe polygoni

III - Rhizoctonia leguminicola

(1) 1 = best, 10 = poorest

(2) 1 = best, 5 = poorest

(3) Percent

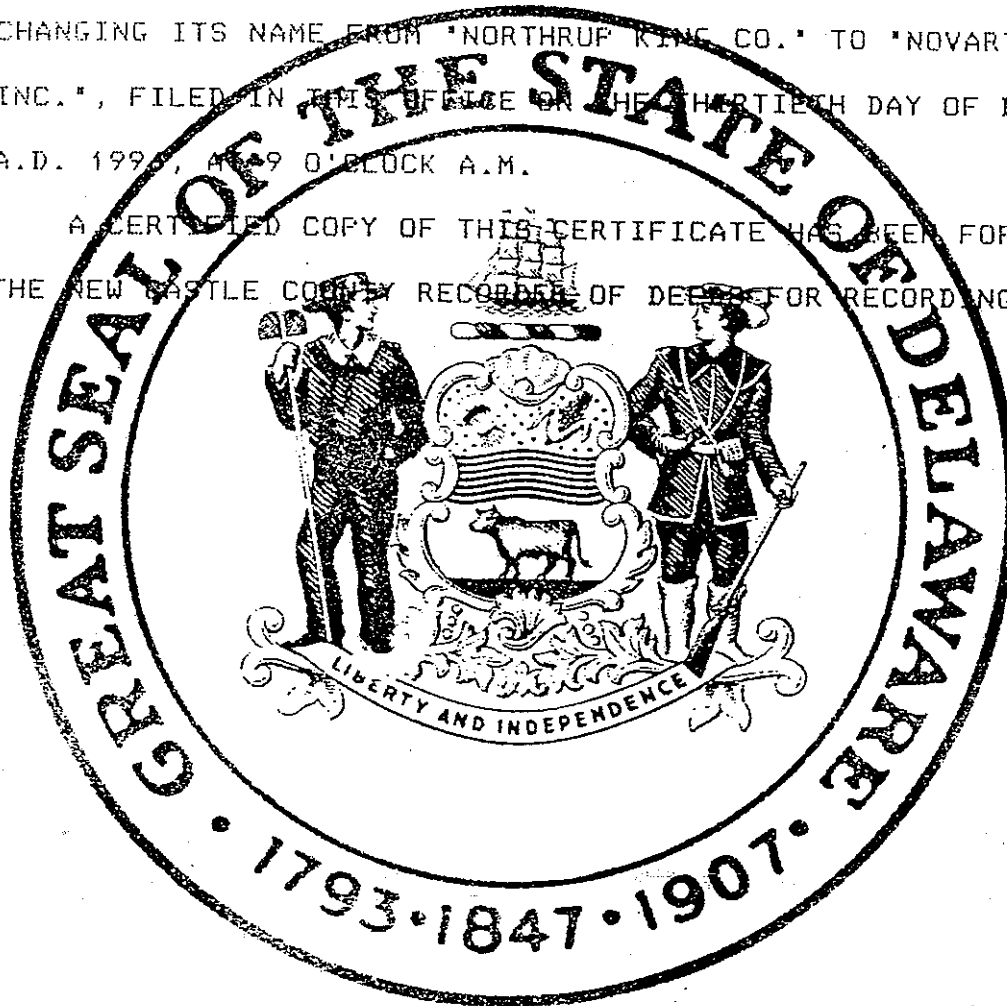
Letters indicate significance in accordance with the Duncan Multiple Range test.

7900041

*Office of the Secretary of State*

I, EDWARD J. FREEL, SECRETARY OF STATE OF THE STATE OF DELAWARE, DO HEREBY CERTIFY THE ATTACHED IS A TRUE AND CORRECT COPY OF THE CERTIFICATE OF AMENDMENT OF "NORTHROP KING CO.", CHANGING ITS NAME FROM "NORTHROP KING CO." TO "NOVARTIS SEEDS, INC.", FILED IN THIS OFFICE ON THE THIRTIETH DAY OF DECEMBER, A.D. 1996, AT 9 O'CLOCK A.M.

A CERTIFIED COPY OF THIS CERTIFICATE HAS BEEN FORWARDED TO THE NEW CASTLE COUNTY RECORDER OF DEEDS FOR RECORDING.



Edward J. Freel, Secretary of State

0829320 8100

960389892

AUTHENTICATION:

8267947

DATE:

12-31-96

CERTIFICATE OF AMENDMENT OF CERTIFICATE OF INCORPORATION  
OF  
NORTHROP KING CO.

It is certified that:

1. The name of the corporation (hereinafter called the "Corporation") is Northrup King Co.

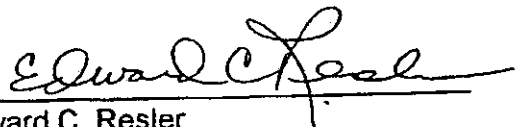
2. The Certificate of Incorporation of the Corporation is hereby amended by striking out Section 1 thereof and by substituting in lieu of said Section the following new Section.

1. The name of the Corporation is Novartis Seeds, Inc.

3. The amendment of the certificate of incorporation herein certified has been duly adopted and written consent has been given in accordance with the provisions of Sections 228 and 242 of the General Corporation Law of the State of Delaware.

4. The effective date of the amendment herein certified shall be January 1, 1997.

Signed on December 27, 1996.

  
Edward C. Resler  
Vice President & Secretary